CHAMBERS' EDINBURGH JOURNAL

CONDUCTED BY WILLIAM AND ROBERT CHAMBERS, EDITORS OF CHAMBERS'S "INFORMATION FOR THE PEOPLE," "CHAMBERS'S EDUCATIONAL COURSE," &c.

NUMBER 620. SATURDAY, DECEMBER 16, 1843. PRICE 1½d.

SUMMER LOITERINGS IN FRANCE.

ORLEANS TO BLOIS.

At the conclusion of last article, we were landed from the railway train at Orleans late at night, and in the midst of a pelting shower of rain, the first we had experienced since leaving home. Along with several other passengers, we took refuge in an inn which had been recommended to our notice—the Hotel de Loiret—the *best*, as it is said, in the town, a compliment which may be quite true without saying much in its favour. Slovenly as this hostelry appeared, we were glad of the shelter of its roof, although, on being left to our own meditations in a shivering cold apartment with a coarse brick floor, we would willingly have resigned the chimney mirror, the or-molu pendule, and its two flanking vases of gum-flowers, for one blink of an English fireside.

With a brilliant sunny morning the discomforts of the night were forgotten, and having breakfasted in a salle, in which we obligingly furnished a meal to as many flies as the atmosphere could conveniently accommodate, off we went to make a day of inspecting the ancient city of Orleans, which I had long had a fancy to see, on account of the remarkable exploits which here crowned the humble maid of Domremy, as the saviour of her country. Let no doting antiquary, however, cherish the delusive idea, that the Orleans of the nineteenth century is the Orleans of French history. Certain architectural improvements have obliterated nearly all that was interesting from historical associations. The town, as its name imports—a corruption of Aurelianum, from its Roman founder Aurelius—is as old as the third century, and till within the last fifty years, it possessed all the characteristics of a city of the middle ages, of which Cologne continues to be a pretty fair specimen. Crowded within walls on a stretch of ground rising from the right bank of the Loire into the great plain of Beauce, it became a cluster of closely built streets and alleys, zig-zagging in all directions, the houses tall and black, with carved and overhanging fronts, and open booths beneath for the convenience of traders. Much of this remains; but as a relief to the general crowding of narrow and dingy thoroughfares, the authorities have very properly run a long and broad street of handsome architecture through the town, called the Rue Royale; and diverging from this at right angles, another equally beautiful street, named the Rue Jeanne d'Arc, has been opened towards the western front of the cathedral. In these two new streets, therefore, the traveller may lounge at his ease without the risk of being ridden over, or stifled with the *désagremens* of the ancient labyrinths.

The ancient walls and gates of Orleans, against which the courageous maid once thundered, are gone. We may lament the loss, but social progress cannot be for ever retarded to please the antiquary. I only wish that a fragment had been preserved, as a memorial consecrated to freedom and patriotism. So, also, has the ancient bridge vanished, which was the principal theatre of Jeanne's heroic attack. A new one of substantial architecture superseded it about eighty years since, at a short distance below where it stood. Proceeding along the Rue Royale, in a southerly direction, we arrive at this modern structure, which consists of nine or ten wide arches, spanning the Loire, which is here of a breadth equal to that of the Thames at Battersea, but more shallow, and much less imposing. The view from the bridge commands a long stretch of river, emerging from and receding into a flat and apparently rich wine and corn country, well dotted over with houses and hamlets. Along the side of the town and on the banks of the opposite suburb, there are tolerably well built quays, at which a few barges may draw up; and immediately beneath the bridge is the landing place of the different steam boats which now navigate the Loire, both above and below Orleans.

Deprived of its ancient bridge and walls, also of its bulwarks and *tourelles* on the southern bank of the river, we can only hazard a conjecture respecting the operations of Joan of Arc, when in her patriotic frenzy she attacked the English redoubts, raised the siege of Orleans, and saved France from what it was on the brink of becoming—an English province. This ever-to-be-remembered incident in the history of France occurred on Sunday the 8th of May 1429, and still, on each successive anniversary, do the city authorities walk in solemn procession, and service is performed in the cathedral in honour of the far-famed Pucelle.

According to custom, one of the first things we went to see in Orleans was the cathedral, the western extremity of which is now opened to view at the foot of the Rue Jeanne d'Arc, but still with other parts too much enclosed by parasitical structures. The building is large, in the usual Gothic style, but plain, heavy, and of comparatively modern date. It was erected on the foundation of a previous church, demolished during the wars of the Huguenots. The re-edification of the structure was begun by Henri Quatre about the year 1600, and the works were continued by succeeding monarchs up till the period of the revolution, when the building came in for its share of popular violence. Robbed of its painted windows by this outbreak, and neither clean nor ornamental inside, the aspect is no way attractive. After sauntering a few minutes round its dingy aisles, and listening to the chant of several priests who, unattended by the slightest vestige of congregation, were performing some sort of service in the choir, we proceeded through various crooked lanes in quest of other objects; saw the spot where, in 1429, the Earl of Salisbury fell mortally wounded; and the house where Joan of Arc is said to have taken up her residence—an antique fronted maison, marked No. 35 in the Rue du Tabourg.

As the chief *lieu* in the department of the Loiret, besides having a population of nearly 50,000 inhabitants, Orleans contains a number of institutions of provincial importance, and possesses some local trade; nothing, however, like what one should expect from its situation on such a large river. Latterly, a publisher of more than usual spirit has issued a considerable number of popular reprints at the usually moderate price of French literature. On the whole, the town must be pronounced dull. There is much smoking, lounging, and positive idling among the cloth-capped and bearded race of young men. How this wide spread fraternity live, is always to me a mystery. Wherever one goes in France, there they are in scores, lounging at the doors of cafés, consuming cigars, spitting, and otherwise gravitating back to barbarism, while the bulk of society seems to be getting forward. It might be imagined that the army would absorb them, and kill them off; but no such thing. They are plus the army and every sort of trade or profession. They must have something to live upon, that is clear—enough to cover the expenses of the café, the billiards, the estaminet, and the table d'hôte. Upon the last mentioned is their sole reliance in the eating department. The innkeepers, who must necessarily serve a large dinner daily for all comers, find in these young idlers a convenient staff, on whom they can rely, and accordingly contract to dine them all the year round at a most insignificant sum per head. They may therefore be said to live very much at the cost of travellers and other transient customers. In some places, they appear to make themselves useful in carving, serving soup, and signaling the garçons; occasionally, also, they make out bills for the landlady, and are always ready to inform strangers where they may find theatres, billiard-rooms, and money-changers. Some of them I have found not unpleasant personages, agreeable in everything but their beard, which they trim with a small-toothed comb, and their spitting, which is incessant. Bating these defects, they are more objects of pity than of contempt. France evidently affords little scope for young men of birth or education, the nature of whose position we can understand, if we consider what England would be without an outlet in the church, colonies, India, and the mercantile establishments of the empire. Is it too much to presume, that if these were wanting, thousands of young gentlemen, now employed, would be found trifling away existence at the doors of taverns, instead of betaking themselves to humble but honest lines of industry?

We had the pleasure of being mingled up with a miscellaneous crowd of this whole and half-idle race of Frenchmen, along with a corresponding number of females, on board the small steam-boat which was to carry us down the Loire. Although neatly, if not elegantly attired, a number of these female passengers were in caps, without bonnets; and this leads me to notice a somewhat remarkable feature in French society, which I have not seen explained elsewhere. It would appear that the wearing of a bonnet of silk, straw, or any other material, distinctly marks a woman as belonging to the lady class. If she has no bonnet, she is nobody; if she wear one, she is at once a person of consideration, at least of pretension. We might expect, that on the common score of vanity, the greater number of women who could spare the cost would not hesitate to assume this important article of attire. Yet they do not do so. They will spend large sums on their muslin and lace caps, but shrink from donning the bonnet. The reason for this is usually less a regard for ancient and local costume, than for not incurring the obligations which the bonnet brings in its train. Bonnets mark ladies, and ladies must not move out of doors without a female attendant, a kind of duenna, who is called their *bonne*. This is a terrible infliction on young Frenchwomen in the middle and higher ranks. We conversed with several young ladies, who told us that they could not cross the street without a bonne trotting at their heels; for if they neglected this precaution, their reputation would stand a chance of being damaged. Think of such a torment! The lady may wish to walk, or to go a-shopping, or to make a few visits; but all such movements are impossible without a mother or a bonne. A brother even will not answer. A bonne, therefore, must be kept by every family of respectability. These bonnes are generally young women, resembling upper servants, and may always be known by their not wearing any kind of bonnets. Should they mount a bonnet, they would require a bonne themselves. "I now perceive the distinction between ladies and bonnes," said I to the young friend who explained this piece of social etiquette; "but if the bonnes take care of the ladies, pray who takes care of the bonnes?" "Oh, of course nobody thinks of them." On hearing of this singular usage, I felt disposed to ridicule it as a singular relic of a rude

state of manners, but remembered that in our own country it is considered unsafe and at variance with etiquette for respectable females of any rank to be seen alone after nightfall. Inferior as this evil is, when it meets with its appropriate correction, we may be permitted to reproach our neighbours for the protection which their ladies seem by custom to require.

Let us, however, turn from these digressions to the river, on which we may be supposed to be in the act of embarking. The Loire, which competes with the Rhone in point of size, and is larger than the Seine, possesses features entirely peculiar to itself. Drawing its chief sources from the mountainous region of Auvergne, whose extinct volcanos form the most remarkable geological curiosity of France, it becomes navigable for barges and small steamers immediately after receiving the Allier at Nevers, which is about a hundred and fifty miles above Orleans, and at least five hundred miles from the ocean. In exceedingly few parts do its banks aspire to the character of picturesque. It runs through a generally flat country, the basis of which is sand and gravel, and vast quantities of these materials are brought down during the wet season. The profusion of loose matter thus carried away from the interior of the country, and ultimately lodged in the bed of the sea, must be immense. Before reaching this final resting-place, however, the gravelly and other sedimentary matter has to perform many vagaries. Loose and light, it is liable to be shifted by floods, deposited as shoals first on one side, then on another, next laid along the centre, and so on without end, altering from point to point throughout the whole course of the stream. This freakishness of character in the Loire almost renders it useless for the navigator, and the liability of its banks to inundation makes it a perpetual source of expense and disquietude. To check its encroachments, one of the largest works of art in the world has been executed in the form of an embankment, from twenty to thirty feet in height, and so broad on the summit as to make a convenient carriage road. This embankment, or *levée*, as it is termed, pursues each side of the river for hundreds of miles, with the exception of such parts as are naturally high and impervious. The sloping side of the *levée* next the river is, in some situations, faced with stone to a certain height, the remainder being green and shrubby, while in many places the highway along the top is lined with rows of trees, forming umbrageous avenues of great beauty and extent. Previous to the erection of these vast embankments, the waters of the Loire frequently deluged great tracts of country, portions of which till this day have all the appearance of a swamp. By being confined within its legitimate channel, the Loire can no longer carry floating debris over the adjoining regions. Restricted to the deposition of shoals, these sometimes accumulate to the extent of bare sand-banks, rearing their ugly heads above the water; a few more depositions give them the character of permanently dry islets; and, finally, turfed over by nature, and artificially planted with willows, they compose beautiful green islands—sunny and bosky little territories—the pride and glory of the Loire.

The steam-navigation of this fluctuating river is of a kind suitable to its character. From Nevers to Orleans the smallest class of boats are employed; at Orleans a new set commence, which proceed as far as Angers; thence a third class still larger descend to Nantes; where a fourth takes passengers on to Paimbœuf; and there a fifth class carry them to St Nazarre, which is on the open sea. These steamers are respectively the property of different companies, and though creditable to the meagre capital and enterprise of France, would generally cut a poor figure on our English rivers. At Orleans, two companies compete in *exploiting* the stream—one having boats a degree more respectable than the other. It was our fate to step on board a steamer paraded as one of the *Inexplosibles*—a small iron vessel, drawing, I was told, only thirteen inches water, and so feeble and rickety, so incapable to all appearance of carrying the crowd of passengers who filled it from stem to stern, that I was not without alarm for the consequences. At the rate of five francs each, which we paid as our fare to Blois, it seemed to me that the value of the whole concern, boat, engine, boilers, and all, would be amply realised.

At the starting neither of diligences nor steamers have the French any notion of keeping to time. The bell of the Inexplosible was rung a dozen times, and M. le Capitaine bawled and fretted on the paddle-box for half an hour beyond the announced hour of starting, before the wheels were in motion, and we were fairly on our voyage down the stream. Yet the delay was not felt to be an inconvenience by the miscellaneous passengers. Accustomed to take things easily, or drawing upon their philosophy or their politeness, they made no fuss or complaint. With scarcely standing, let alone sitting room, all seemed as happy as possible, chatting, laughing, smoking, and, I may add, spitting, wherever a spare inch of deck or cabin permitted that elegant indulgence. Moving about was scarcely among things accomplishable, for the deck of these vessels, besides being small, is interrupted by the elevation of the cabin, which crosses from side to side; and as the roof is only canvass, there is no passage fore and aft, except by going through this enclosed apartment.

Seated in a tranquil corner, which we were fortunate in securing behind a pile of luggage, we had an opportunity of enjoying the clear sunshine, and an uninterrupted view of the river banks as they seemed to be drawn out for our observation. The vessel for the most part kept to a current on the right side, running occasionally under a bluff bearing an old chateau with its formal bereceau walks and garden, and at another time passing a bank clad in vines exposed to the noonday sun. At a short distance below Orleans, on the left bank, we passed the mouth of the Loiret, a small river which rises suddenly from the ground a few miles from the Loire, and gives its name to the department. A little further on, upon the same side, and opposite the vineyards of St Ay, was seen rising in the distance the church spire of Notre Dame de Cléry, whose shrine, it will be remembered, was a favourite resort of Louis XI., and within whose walls the body of the bigot and tyrant was buried. At Mehun we passed beneath a suspension-bridge of four spans, the first of a series of such splendid works recently thrown over the Loire below Orleans. Beaugency, situated on the right bank some miles further down, is the largest town between Orleans and Blois, but ancient in aspect, and celebrated only for its wines, which are reckoned among the finest in the Orleanois. We afterwards passed the villages of St Mer, Suevres, and Menars, all on the same, or right side of the river, and St Die on the left. Menars presented the most interesting point in our journey; for the grounds are here tastefully wooded, and the scene enlivened with a large and white chateau, once inhabited by Madame Pompadour, and now used as an influential seminary of instruction for youth. A few miles below Menars, and when the sun was declining in the latter part of the day, our vessel, partially lightened by the frequent stoppages it had made in its course, brought us within view of the much-looked-for Blois, our resting-place for the night, perched on the face and summit of a hill rising from the right margin of the Loire, over whose waters it commands an extensive and lovely prospect.

"FAMILIAR LETTERS ON CHEMISTRY."

FIRST ARTICLE.

SUCH is the title of a recent publication by Dr Justus Liebig, to whom Europe is already indebted for some of the most important discoveries in chemistry, as applicable to the physiology of the vegetable and animal creations. Written in a familiar style, and divested as much as possible of technical terms, these letters* are addressed to the general reader, not with a view to teach the elements of chemistry, but to present some of the most important points of the science in its application to natural philosophy, physiology, agriculture, and commerce. They are intended to be mere sketches, and are published "for the especial purpose of exciting the attention of governments, and an enlightened public, to the necessity of establishing schools of chemistry, and of promoting by every means the study of a science so intimately connected with the arts, pursuits, and social well-being of modern civilised nations." This being the generous intention of the author, it is gratifying to learn that it has not failed to produce some of the results anticipated; and that new professorships have been established in the universities of Göttingen and Würtzburg, for the express purpose of facilitating the application of chemical truths to the practical purposes of life. As yet, little has been done in Britain towards the general diffusion of this species of knowledge; and, hopeful that his remarks might in some degree further that object, Professor Liebig, at the request of several friends, readily acquiesced in the publication of the English edition of his letters now before us. Entering cordially and fully into the design of the author, we shall present our readers with a general scope of his little treatise—avowing with him the conviction, "that ere long a knowledge of the principal truths of chemistry will be expected in every educated man, and that it will be as necessary to the statesman and political economist, and to the practical agriculturist, as it is already indispensable to the physician and the manufacturer."

The topics embraced by these letters may be arranged under four distinct heads:—1. The general progress of chemistry as a branch of natural history; 2. Its importance in the arts and in commerce; 3. Its alliance to vegetable and animal physiology; and, 4. Its application to the advancement of agriculture. Under the first of these heads the author alludes to the limited chemical knowledge of the ancients, who regarded fire, air, earth, and water, as the "elements" of nature; dates the rise of modern chemistry from the time of Lavoisier's analysis of water into oxygen and hydrogen, and of air into oxygen and nitrogen; and shows its rapid advancement by the fact, that, in little more than half a century, philosophers have not only resolved all known bodies into fifty-four elements, but have actually succeeded in the formation of substances similar to those constructed by nature, by re-combining these simple elements in certain given proportions. In tracing the progress of chemistry as here alluded to, Professor Liebig sets out by calling attention to the simplicity of the implements which the chemist employs in his multifarious investigations. In the time of Lavoisier, the rich alone could make chemical researches, the necessary apparatus being only procurable at great expense; now, a laboratory sufficient for most purposes can be fitted up for a few pounds. The implements which he enumerates, or rather the materials of which they are made, are glass, cork, caoutchouc, platinum, and the balance. By the balance the proportions of bodies are ascertained with precision; in platinum crucibles, which are infusible at all temperatures of our furnaces, and which are not acted upon by acids, minerals and metals are readily fused; of cork and caoutchouc, which are impermeable to liquid and gaseous bodies, joints and stoppers are easily formed, which would otherwise require the costly aid of the mechanician at every step; and from glass, which is at once transparent, hard, or ductile, capable of being made to assume any form, and unaffected by most acids, every variety of vessel is procured for containing the chemist's materials. "Such," adds he, "are our instruments. An equal improvement has been accomplished in our laboratory. There is no longer the damp, cold, fireproof vault of the metallurgist, nor the manufactory of the druggist, fitted up with stills and retorts. On the contrary, a light, warm, comfortable room, where beautifully constructed lamps supply the place of furnaces, and the pure and odourless flame of gas or of spirits of wine supersedes coal and other fuel, and gives us all the fire we need; where health is not invaded, nor the free exercise of thought impeded; there we pursue our inquiries, and interrogate Nature to reveal her secrets."

It has been already stated, that Professor Liebig dates the rise of modern chemistry from the period of Lavoisier's discoveries. After his day, the principal problem of chemists was to determine the composition of the solid matters composing the earth. In due time science and research solved the problem. To the eighteen metals previously known were soon added twenty-four, discovered to be constituents of minerals; and the crust of the globe was thus shown to consist of metals in combination with oxygen, forming compounds which are termed metallic oxides. The metals and metallic oxides thus discovered, together with the gases and some other bodies, such as carbon, sulphur, phosphorus, &c., make up the fifty-four simple elements into which chemical science has yet been able to resolve all known substances. The chemist, however, did not rest satisfied with the separation of minerals into their component elements, that is, their *analysis*; but he sought by *synthesis*, that is, by combining the separate elements, to form substances similar to those constructed by nature. Thus he formed pumice-stone, basalt, felspar, mica, iron pyrites, &c., by artificial processes. "But of all the achievements of inorganic chemistry," says Liebig, "the artificial formation of lapis lazuli was the most brilliant and the most conclusive. This mineral, as presented to us by nature, is calculated powerfully to arrest our attention by its beautiful azure-blue colour, its remaining unchanged by exposure to air or to fire, and furnishing us with a most valuable pigment—ultramarine—more precious than gold! The analysis of lapis lazuli represented it to be composed of silica, alumina, and soda, three colourless bodies, with sulphur and a trace of iron. Nothing could be discovered in it of the nature of a pigment, nothing to which its blue colour could be referred, the cause of which was searched for in vain. It might therefore have been supposed that the analyst was here altogether at fault, and that, at any rate, its artificial production must be impossible. Nevertheless this has been accomplished, and simply by combining in the proper proportions (as determined by analysis) silica, alumina, soda, iron, and sulphur. Thousands of pounds weight are now manufactured from these ingredients, and this artificial ultramarine is as beautiful as the natural; while for the price of a single ounce of the latter we may obtain many pounds of the former." As with the lapis lazuli, so with other matter. The chemist has not only succeeded in reducing the most refractory substances to their simple elements, but, by the union of these elements, has reconstructed bodies identical with the productions of nature. As yet, there is a wide and uncultivated field before him, but the triumph of the past makes him sanguine of success of the future. By the agency of electricity and galvanism, by high and long continued temperatures, by the application of small and gradual forces, and by other analogous powers, which may be styled the dynamics of chemistry, science has already accomplished wonders; and the time seems not far distant when it will be enabled to imitate the inorganic products of nature, not only in their chemical character, but in their forms, colours, and internal arrangements. It is true that science does not attempt the formation of an element, any more than it would the production of a vital organ, but what are now esteemed as elementary bodies may yet be reduced to still simpler forms, and instead of fifty, there may be only five, or even a still smaller number of original elements.

To prove an identity among several of the "elementary bodies," that is, to convert by peculiar treatment one substance into another, seems at present to be the summit of chemical ambition; and if such a

* Familiar Letters on Chemistry, and its relation to Commerce, Physiology, and Agriculture. By Justus Liebig, M.D., Professor of Chemistry in the University of Giessen. Edited by John Gardner, M.D. London: Taylor and Walton. 1843.

conversion be possible, the means and appliances within the power of the chemist could scarcely be more favourable for his purpose. For the sake of classification, it has been found convenient to consider bodies as being either in a solid, liquid, or gaseous form; but the modern chemist recognises no such permanent distinctions. Means have been devised by which he can effect a change upon every known substance, and can render almost all of them solid, liquid, or gaseous at his will. Platinum, alumina, and rock-crystal, which the furnaces of former chemists left intact, can now be made to melt like wax before the oxy-hydrogen blowpipe; and substances which will not melt by themselves can be rendered readily fusible by admixture with a second substance. What cannot be accomplished by the power of combustion, is readily effected by galvanic or electrical agency; and other changes are produced by the application of gradual forces, or by the yet little understood laws which regulate internal or atomical arrangement. As with solids, so with liquids and gases; liquids subjected to heat become gaseous—deprived of it, they assume a solid form; and gases subjected to pressure become liquid, and thence solid. Carbonic acid gas, for example, can be rendered fluid under a pressure equal to that of thirty-six atmospheres (540 lbs. upon the square inch); and while in this state, if a small quantity is permitted to escape into the atmosphere, it assumes its gaseous form with extraordinary rapidity, and deprives the remaining fluid of caloric so rapidly, that it congeals into a white crystalline mass like snow.* Thus, we may have carbonic acid as a gas, as a liquid, or as a solid. In the former state, most people are acquainted with its properties; as a fluid, it is one of the most explosive and dangerous agents in nature; while as a solid, it can be handled with as much impunity as flakes of snow. As the chemist can produce an extraordinary degree of heat by means of the oxy-hydrogen blowpipe or by electricity, so he can also by several means produce extraordinary cold. For instance, the transition of solid carbonic acid into gas deprives all around it of caloric so rapidly, and to so great an extent, that a degree of cold is produced immeasurably great, the greatest indeed known. "Ten, twenty, or more pounds weight of mercury," says Liebig, "brought into contact with a mixture of ether and solid carbonic acid, become in a few minutes solid and malleable!" Other instances might be enumerated, but enough has been stated to show the extent and powers of the means at the command of the chemist for altering, decomposing, and reconstructing the various inorganic products of nature. Whether chemical science will yet succeed in reducing the fifty-four elementary bodies into one-half, or even one-tenth of their present number, is a problem yet unsolved—the highest aspiration of abstract chemistry. Professor Liebig seems to be rather despondent than hopeful of such a result. Let us glance at his reasoning.

The atomic theory—to which chemistry is indebted for all that is accurate and harmonious in its results—supposes matter to be composed of atoms or particles immeasurably small, but not susceptible of infinite division. Thus, two crystals of matter may lie together for ages without any change taking place; they may even be pounded to the minutest powder, and mingled, yet no union be effected; but reduce them to a greater degree of minuteness, in other words, to their ultimate atoms, by dissolving them in water, and immediately their atoms combine, and form a new chemical compound or compounds. This theory further supposes that the atoms of different substances always combine, or arrange themselves together in a fixed definite proportion; that water, for example, is formed by a fixed amount of oxygen uniting with a fixed amount of hydrogen; that sulphuric acid is also formed by the union of a fixed amount of sulphur and oxygen; and that no other proportions of oxygen and hydrogen could form water, or sulphur and oxygen sulphuric acid. But while this is the fact, it has been discovered that many organic substances are composed of the same elements, in the same relative proportions, and yet exhibiting physical and chemical properties perfectly distinct from each other. To such substances the term *isomeric* (from *isos*, equal, and *meros*, a part) is applied. "A great class of bodies," says Liebig, "known as the volatile oils—oil of turpentine, essence of lemons, oil of balsam, of copaiba, oil of rosemary, oil of juniper, and many others, differing from each other in their odour, in their medicinal effects, in their boiling point, in their specific gravity, &c., are exactly identical in composition; they contain the same elements, carbon and hydrogen in the same proportions. These remarkable truths, so highly important in their applications, were not received and admitted as sufficiently established without abundant proofs. The composition of isomeric bodies was not only obtained by analysis, but they were converted and reconverted into each other without addition and without subtraction." The example which Professor Liebig gives of this conversion and reconversion is that of three substances, called cyanuric acid, hydrated cyanic acid, and cyamelide. "Cyanuric acid is crystalline, soluble in water, and capable of forming salts with metallic oxides. Hydrated cyanic acid is a volatile and highly blistering fluid, which cannot be brought into contact with water without being instantly decomposed. Cyamelide is a white substance, very like porcelain, absolutely insoluble in water. Now, if we place cyanuric acid in a vessel hermetically sealed, and apply a high degree of heat, it is converted by its influence into hydrated cyanic acid; and then, if this is kept for some time at the common temperature, it passes into cyamelide—no other element being present. And again, inversely, cyamelide can be converted into cyanuric acid and hydrated cyanic acid." This isomerism of compound bodies proves, according to our author, that the ultimate atoms of bodies "arrange themselves side by side in a certain order, and that the properties of the compound depend entirely upon this order. If they are made to change their place—their mode of arrangement—by an impulse from without, they combine again in a different manner, and another compound is formed with totally different properties. We may suppose that one atom combines with one atom of another element to form a compound atom; while in other bodies, two and two, four and four, eight and eight, are united; so that in all such compounds, the amount per cent. of the elements is absolutely equal; and yet their physical and chemical properties must be totally different, the constitution of each atom being peculiar—in one body consisting of two, in another of four, in a third of eight, and in a fourth of sixteen simple atoms."

Such is Liebig's explanation of isomerism. His rationale of the two states—*amorphous* and *crystalline*—which solid bodies assume is equally plausible. "When matter is passing from a gaseous or liquid state slowly into a solid, an incessant motion is observed, as if the molecules were minute magnets. They are seen to repel each other in one direction, and to attract and cohere together in another, and in the end become arranged into a regular form, which, under equal circumstances, is always the same for any given kind of matter; that is, crystals are formed. Time and freedom of motion for the particles of bodies are necessary to the formation of crystals. If, however, we force a fluid or gas to become suddenly solid, leaving no time for its particles to arrange themselves, and cohere in that direction in which the cohesive attraction is strongest, no crystal will be formed, but the resulting solid will have a different colour, a different degree of hardness and cohesion, and will refract light differently—in one word, will be amorphous. Thus, we have cinnabar as a red, or as a jet-black substance; sulphur a fixed and brittle body, or soft and ductile; glass as a milk-white and opaque substance, so hard that it strikes fire with steel, or in its ordinary and well known state of brittleness and transparency. These dissimilar states and properties of the same body are occasioned in one case by a regular, in the other by an irregular arrangement of its atoms; one is crystalline, the other amorphous.

Again, several bodies are said to be *isomorphic*—that is, are possessed of an equality of form, and are yet different in chemical composition; and this also tends to prove *that matter consists of atoms, the mere arrangement of which produces all the properties of bodies.* But when we find that a *different arrangement* of the *same* elements gives rise to *various* physical and chemical properties, and a *similar arrangement of different* elements produces properties very much the *same*, may we not inquire whether some of these bodies, which we regard as elements, may not be merely modifications of the same substance? whether they are not the same matter in a different state of arrangement?" This question, after reasoning, Professor Liebig answers in the negative, and regards those elements which present a remarkable similarity of properties (such as platinum and iridium, bromine and iodine, sulphur and selenium, rhodium and iron, &c.) to be still distinct elements, but presenting a similarity, because their primary atoms are arranged in the same manner. "We have not," he continues, "at present the remotest ground to suppose that any of those substances which chemists regard as elements can be converted into another. Such a conversion, indeed, would presuppose that the "element" was compounded of two or more ingredients, and was in fact not an element; and until the decomposition of these bodies is accomplished, and their constituents discovered, all pretensions to such conversions deserve no notice." Such are Professor Liebig's views as to the separate identity of the elementary constituents; others are of a different opinion, and among them Dr Samuel Brown of Edinburgh, who has published his processes for converting several of the so-called elements, namely, carbon and silicon, carbon and boron, rhodium and iron.* Further investigation is necessary to establish this high point of chemical research; at present it seems debateable ground, and we avoid it.

In presenting an outline of the progress of chemical science, the sketch were imperfect and deceptive did not we advert to its importance in the arts and pursuits of civilised life. The conversions and reconversions of the chemist, his imitations of nature, and his perfect intimacy with the character of her every production, were at best but philosophical trifles and curiosities, did not they bear directly on the melioration of the physical and social condition of man. Perhaps to chemistry, more than any other of the natural sciences, are we indebted for that advancement which has been recently made in the wealth, elegance, and comfort of social life; and to the same source we still look for further extensive improvement in the arts, commerce, agriculture, medicine, and physiology. But of these in another article.

* This treatment of carbonic acid gas suggests the idea "that coal gas may yet be condensed into a white, dry, solid, odourless substance, portable and capable of being placed upon a candlestick and burned!"

* See Journal for July 1, 1843, which contains an outline of Dr Brown's theory and discoveries.

THE BUSHEL OF CORN.

A STORY.*

Farmer Gray had a neighbour who was not the best tempered man in the world, though in the main kind and obliging. He was a shoemaker. His name was Barton. One day in harvest time, when every hand on the farm was busy, this man came over to Farmer Gray's, and told him, in rather a petulant tone, to send over and drive home his geese, for they were troubling his pigs and entering his garden. Farmer Gray replied mildly that he was sorry for it, but begged his neighbour to bear it a little longer, till he was at leisure to remedy the evil.

"I'll attend to them for you; see if I don't," the shoemaker said, still more angrily than when he first called upon Farmer Gray, and then turned upon his heel and strode off hastily towards his own house, which was quite near to the old farmer's.

"What upon earth can be the matter with these geese?" Mrs Gray said about fifteen minutes afterwards.

"I really cannot tell, unless neighbour Barton is taking care of them. He threatened to do so if I didn't attend to them immediately."

"John! William! run over and see what Mr Barton is doing with my geese," Mrs Gray said in a quick and anxious tone to two little boys who were playing near.

The urchins scampered off, well pleased to perform any errand.

"Oh, if he has dared to do anything to my geese, I will never forgive him!" the wife said angrily.

"Hush, Sally; make no rash speeches. It is more than probable that he has killed some two or three of them. But never mind if he has; he will get over his pet, and be sorry for it."

"Yes, but what good will his being sorry do me? Will it bring my geese to life?"

"Ah, well, Sally, never mind. Let us wait until we learn what all this disturbance is about."

In about ten minutes the children came home, bearing the bodies of three geese, each without a head.

"Oh, isn't that too much for human endurance?" exclaimed Mrs Gray. "Where did you find them?"

"We found them lying out in the road," said the elder of the two children. "And when we picked them up, Mr Barton said—'Tell your father that I have taken care of his geese for him, to save him the trouble, as his hands are all too busy to do it.'"

"I'd sue him for it," said Mrs Gray in an indignant tone.

"And what good would that do, Sally?"

"Why, it would do a great deal of good. It would teach him better manners. It would punish him; and he deserves punishment."

"And punish us into the bargain. We have lost three geese now, but we still have their well-fed bodies to eat. A lawsuit would cost us a good many geese, and not leave us even so much as the feathers, besides giving us a world of trouble and vexation. No, no, Sally; just let it rest, and he will be sorry for it, I know."

"Sorry for it, indeed! And what good will his being sorry for it do us, I should like to know? Next, he will kill a cow, and then we must be satisfied with his being sorry for it! Now, I can tell you that I don't believe in that doctrine. Nor do I believe anything about his being sorry; the crabbed ill-natured wretch."

"Don't call hard names, Sally," Farmer Gray said in a soothing tone. "Neighbour Barton was not himself when he killed the geese. Like every other angry person, he was a little insane, and did what he would not have done had he been perfectly in his right mind. When you are a little excited, you know, Sally, that even you do and say unreasonable things."

"Me do and say unreasonable things!" exclaimed Mrs Gray, with a look and tone of indignant astonishment; I don't understand you, Mr Gray."

"Maybe I can help you a little. Don't you remember how angry you were when Mr Mellon's old Brindle got into our garden, and trampled over your lettuce bed; and how you struck her with the oven pole, and knocked off one of her horns?"

"But I didn't mean to do that, though."

"No; but then you were angry, and struck old Brindle with a right good will. And if Mr Mellon had felt disposed, he might have prosecuted for damages."

"But she had no business there."

"Of course not; neither had our geese any business

* We find this pleasing sketch in a paper called the Philadelphia Saturday Evening Post, to which it appears to have been contributed by T. S. Arthur, a popular tale-writer in the United States. It is here slightly abridged in two or three places.

in neighbour Barton's yard. Let us then consider the matter a little, and give our neighbour time to get over his angry fit. It will be much better to do so."

Mrs Gray saw that her husband was right, but still she felt indignant at the outrage committed on her geese. She did not, however, say anything about suing the shoemaker; for old Brindle's head, from which the horn had been knocked off, was not yet entirely well, and one prosecution very naturally suggested the idea of another. So she took her three fat geese, and after stripping off their feathers, had them prepared for the table.

Next morning, as Mr Gray was going along the road, he met the shoemaker; and as they had to pass very near to each other, the farmer smiled and bowed, and spoke kindly. Barton looked and felt very uneasy, but Farmer Gray did not seem to remember the unpleasant incident of the day before.

It was about eleven o'clock of the same day that one of Farmer Gray's little boys came running to him, and crying, "Oh! father, father, Mr Barton's hogs are in our corn-field."

"Then I must go and drive them out," said Mr Gray in a quiet tone.

"Drive them out!" ejaculated Mrs Gray. "Drive them out, indeed. I'd shoot them; that's what I'd do. I'd serve him as he served my geese yesterday."

"But that wouldn't bring the geese to life again, Sally."

"I don't care if it wouldn't. It would be paying him in his own coin, and that's what he deserves."

"You know what the Bible says, Sally, about grievous words, and they apply with stronger force to grievous actions. No, no; I will return neighbour Barton good for evil; that is the best way. He has done wrong, and I am sure is sorry for it; and as I wish him still to remain sorry for so unkind and unneighbourly an action, I intend making use of the best means for keeping him sorry."

"Then you will not be revenged on him, any how?"

"No, Sally, not revenged. I hope I have no such feeling; for I am not angry with neighbour Barton, who has done himself a much greater wrong than he has done me. But I wish him to see clearly how wrong he has acted, that he may do so no more; and then we shall not have any cause to complain of him, nor he any to be grieved, as I am sure he is, at his own hasty conduct. But while I am talking here, his hogs are destroying my corn."

And so saying, Farmer Gray hurried off towards his corn-field. When he arrived there, he found four large hogs tearing down the stalks, and pulling off and eating the ripe ears of corn. They had already destroyed a good deal; but he drove them out very calmly, and put up the bars through which they had entered, and then commenced gathering up the half-eaten ears of corn, and throwing them out into the lane, for the hogs that had been so suddenly disturbed in the process of obtaining a liberal meal. As he was thus engaged, Mr Barton, who had from his own house seen the farmer turn the hogs out of his corn-field, came hurriedly up and said, "I am very sorry, Mr Gray, indeed I am, that my hogs have done this. I will most cheerfully pay you for what they have destroyed."

"Oh, never mind, friend Barton; never mind. Such things will happen occasionally. My geese, you know, annoy you very much sometimes."

"Don't speak of it, Mr Gray. They didn't annoy me half as much as I imagined they did. But how much corn do you think my hogs have destroyed? One bushel, or two bushels? Or how much? Let it be estimated, and I will pay you for it most cheerfully."

"Oh no; not for the world, friend Barton. Such things will happen sometimes. And besides, some of my men must have left the bars down, or your hogs could never have gone in. So don't think any more about it. It would be dreadful if one neighbour could not bear a little with another."

All this cut poor Barton to the heart. His own ill-natured language and conduct at a much smaller trespass on his rights presented itself to his mind, and deeply mortified him. After a few moments' silence, he said, "The fact is, Mr Gray, I shall feel better if you will let me pay for this corn. My hogs should not be fattened at your expense, and I will not consent to its being done. So I shall insist on paying you for at least one bushel of corn; for I am sure they have destroyed that much, if not more."

But Mr Gray shook his head and smiled pleasantly as he replied, "Don't think anything more about it, neighbour Barton. It is a matter deserving no consideration. No doubt my cattle have often trespassed on you, and will trespass on you again. Let us then bear and forbear."

All this cut the shoemaker still deeper, and he felt still less at ease in mind after he parted from the farmer than he did before. But on one thing he resolved, and that was, to pay Mr Gray for the corn which his hogs had eaten.

"You told him your mind pretty plainly, I hope?" Mrs Gray said as her husband came in.

"I certainly did," was the quiet reply.

"And I am glad you had spirit enough to do it. I reckon he will think twice before he kills any more of my geese."

"I believe you are right, Sally. I don't think we shall be troubled again."

"What did you say to him? And what did he say for himself?"

"Why, he wanted very much to pay me for the corn his hogs had eaten; but I wouldn't hear of it. I told him that it made no difference in the world—that such accidents would happen sometimes."

"And that's the way you spoke your mind to him?"

"Precisely, and it had the desired effect. It made him feel ten times worse than if I had spoken angrily to him. He is exceedingly pained at what he has done, and says he will never rest until he has paid for that corn. But I am resolved never to take a cent for it. It will be the best possible guarantee I can have for his kind and neighbourly conduct hereafter."

"Well, perhaps you are right," Mrs Gray said, after a few moments of thoughtful silence. "I like Mrs Barton very much, and now I come to think of it, I should not wish to have any difference between our families."

"And so do I like Mr Barton. He has read a good deal, and I find it very pleasant to sit with him occasionally during the long winter evenings. His only fault is his quick temper; but I am sure it is much better for us to bear with, and soothe that, than to oppose and excite it, and thus keep both his family and our own in hot water."

"You are certainly right," Mrs Gray said, "and I only wish that I could always think and feel as you do. But I am a little quick, as they say."

"And so is Mr Barton. Now, just the same consideration that you would desire others to have for you, should you exercise towards Mr Barton, or any one else whose hasty temper leads him into words or actions that in calmer and more thoughtful moments are subjects of regret."

On the next day, while Mr Gray stood in his own door, from which he could see all over the two or three acres of ground that the shoemaker cultivated, he observed two of his own cows in his neighbour's corn-field, browsing away in quite a contented manner. As he was going to call one of the farm hands to go over and drive them out, he perceived that Mr Barton had become aware of the mischief that was going on, and had already started for the field of corn.

"Now, we will see the effect of yesterday's lesson," the farmer said to himself; and then paused to observe the manner of the shoemaker towards his cattle in driving them out of the field. In a few minutes Mr Barton came up to the cows, but instead of throwing stones at them, or striking them with a stick, he merely drove them out in a quiet way, and put up the bars through which they had entered.

"Admirable!" ejaculated Farmer Gray.

"What is admirable?" asked his wife, who came within hearing distance at the moment.

"Why, the lesson I gave our friend Barton yesterday works admirably."

"How so?"

"Why, two of our cows were in his corn-field a few minutes ago destroying the corn at a rapid rate."

"Well, what did he do to them?"

"He drove them out."

"Did he stone them or beat them?"

"Oh no; he was as gentle as a child towards them."

"You are certainly jesting?"

"Not I. Friend Barton has not forgotten that his pigs were in my corn-field yesterday, and that I turned them out without hurting a hair of one of them. Now, suppose I had got angry, and beaten his hogs, what do you think the result would have been? Why, it is much more than probable that one or both of our fine cows would have been at this moment in the condition of Mr Mellon's old Brindle."

"I wish you wouldn't say anything more about old Brindle," Mrs Gray said, trying to laugh, while her face grew red in spite of her efforts to keep down her feelings.

"Well, I wont, Sally, if it worries you; but it is such a good illustration that I cannot help using it sometimes."

"I am glad he didn't hurt the cows," Mrs Gray said, after a pause.

"And so am I, Sally; glad on more than one account. It shows that he has made an effort to keep down his hasty irritable temper; and if he can do that, it will be a favour conferred on the whole neighbourhood; for almost every one complains, at times, of this fault in his character."

"It is certainly the best policy to keep fair weather with him," Mrs Gray remarked; "for a man of his temper could annoy us a great deal."

"That word policy, Sally, is not a good word," her husband replied. "It conveys a thoroughly selfish idea. Now, we ought to look for some higher motive of action than mere policy—motives grounded in correct and unselfish principles."

"But what other motive but policy could we possibly have for putting up with Mr Barton's outrageous conduct?"

"Other and far higher motives, it seems to me. We should reflect that Mr Barton has naturally a hasty temper; and that, when excited, he does things for which he is sorry afterwards; and that, in nine cases out of ten, he is a greater sufferer from these outbreaks than any one else. In our actions towards him, then, it is a much higher and better motive for us to be governed by a desire to aid him in the correction of this evil, than to look merely to the protection of ourselves from its effects. Do you not think so?"

"Yes; it does seem so."

"When thus moved to action, we are, in a degree, obliging the whole neighbourhood, for the evil of which we speak affects all. And in thus suffering ourselves to be governed by such elevated and unselfish motives, we gain all that we possibly could have gained under the mere instigation of policy, and a great deal more. But to bring the matter into a still narrower compass. In all our actions towards him, and every one else, we should be governed by the simple consideration—is it right? If a spirit of retaliation be not right, then it cannot be indulged without a mutual injury. Of course, then, it should never prompt us to action; for if cows or hogs get into my field or garden, and destroy my property, who is to blame most? Of course myself. I should have kept my fences in better repair, or my gate closed. The animals certainly are not to blame, for they follow only the promptings of nature; and their owners should not be censured, for they know nothing about it. It would then be very wrong for me to injure both the animals and their owners for my own neglect—would it not?"

"Yes; I suppose it would."

After this there was no more trouble about Farmer Gray's geese or cattle. Sometimes the geese would get among Mr Barton's hogs, and annoy them while eating, but it did not worry him as it did formerly. If they became too troublesome, he would drive them away, but not by throwing sticks and stones at them, as he once did.

Late in the fall, the shoemaker brought in his bill for work. It was a pretty large bill, with sundry credits.

"Pay-day has come at last," Farmer Gray said good-humouredly, as the shoemaker presented his account. "Well, let us see," and he took the bill to examine it, item after item.

"What is this?" he asked, reading aloud. "*Cr.* By one bushel of corn, fifty cents."

"It's some corn I had from you."

"I reckon you must be mistaken. You never got any corn from me."

"Oh yes, I did. I remember it perfectly. It is all right."

"But when did you get it, friend Barton? I am sure that I hav'n't the most distant recollection of it."

"My hogs got it," the shoemaker said in rather a low and hesitating tone.

"Your hogs!"

"Yes. Don't you remember when my hogs broke into your field and destroyed your corn?"

"Oh dear! is that it? Oh no, no, friend Barton, I cannot allow that item in the bill."

"Yes, but you must. It is perfectly just—and I shall never rest until it is paid."

"I can't indeed. You couldn't help your hogs getting into my field; and then, you know, friend Barton" (lowering his voice), "my geese were very troublesome."

The shoemaker blushed, and looked confused, but Farmer Gray slapped him familiarly on the shoulder, and said in a lively cheerful way—"Don't think anything more about it, friend Barton. And, hereafter, let us endeavour to do as we would be done by, and then everything will go on as smooth as clock-work."

"But you will allow that item in the bill?" the shoemaker urged perseveringly.

"Oh no, I couldn't do that; I should think it wrong to make you pay for my own or some of my men's negligence in leaving the bars down."

"But then" (hesitatingly) "those geese. I killed three; let it go for them."

"If you did kill them we ate them, so that is even. No, no; let the past be forgotten; and if it makes better neighbours and friends of us, we never need regret what has happened."

Farmer Gray remained firm, and the bill was settled, omitting the item of "corn." From that time forth he never had a better neighbour than the shoemaker. The cows, and hogs, and geese of both, would occasionally trespass—but the trespassers were always kindly removed. The lesson was not lost on either of them, for even Farmer Gray had been wont to feel sometimes a little annoyed when his neighbour's cattle broke into his field. But in teaching the shoemaker a lesson, he had taken a little of it to himself.

BURNETT'S ANTISEPTIC SOLUTION.

The plan patented by Sir William Burnett for the preservation of timber, canvass, cordage, &c., from dry rot, mildew, moth, and the destructive effects of damp, or the combined action of air and water, is by a colourless metallic salt, which is prepared for use by solution in water, in the proportion of one pound of the substance to ten gallons of water; which quantity is sufficient to prepare and preserve half a load of timber. By a hydraulic injecting apparatus employed in her majesty's dockyard at Portsmouth (which is capable of saturating twenty loads of timber at a time), the gravity of the wood is in-

creased 64 per cent., although afterwards lessened by drying; by a stronger solution than the above, wood, canvass, cordage, &c., are rendered incombustible, and all the men-of-war are, in future, to have their magazines fitted with wood and felt, especially prepared for this purpose. The solution, colourless itself, does not affect the colour of the material to which it is applied. From a prospectus issued by the patentee, we learn that numerous experiments have been tried, extending over a period of nine years, to ascertain with certainty the effect of the process on various substances. Specimens of English oak, English elm, and Dantzic fir, one of each prepared with the solution, and one of each unprepared, were placed in the fungus pit at Woolwich, on the 25th August 1836, and taken out on the 15th July 1841, when the prepared specimens were found to be perfectly sound, while the unprepared English oak had a spot of fungus on one end, the English elm was decayed, and the Dantzic fir had fungus outside, and was decayed at heart. A quantity of Burnetised deals, with other pieces of the same wood unprepared, were put down in the damp cellar of a house in Chatham dockyard, where the floors had been repeatedly destroyed by dry rot, and where large fungi were growing in 1838, and in 1842 all the unprepared wood had become completely rotten, while the Burnetised portion was perfectly sound. Six pieces of canvass, and three of woollen cloth prepared, and the like samples unprepared, were placed in a hole four feet deep, in a damp situation, and exposed to the sun, where they remained six months; they were then taken up, washed in plain water, and dried, then placed in a deal box, and deposited in a damp sink, but not in contact with water; they were left in this situation nine weeks, and when examined, the prepared articles were perfect as ever, the unprepared perfectly rotten. These are a few of the experiments, and which are sufficient to show the nature of the process, and the powerful effects of the solution, which is now universally adopted in her majesty's dockyards, and is coming into very general use.

INTERNAL MIGRATION.

THE census tables for 1841 enable us to form a tolerably correct notion of the internal migration which takes place in the United Kingdom. They show us the birthplaces of all the persons in the realm, and we are thus able to say what proportion of the people of each of the kingdoms, and even of the counties of the various kingdoms, reside in a particular place, as well as what proportion of the people of each kingdom leave it to go to some other part of the home empire. The result is in some parts rather surprising.

ENGLAND.

Population in 1841—Males,	7,323,387	
Females,	7,671,751	
		14,995,138
Place of Birth.		
Born in the counties where they live,		12,091,694
Born in other counties of England,		2,370,556
Born in Scotland,		102,065
Born in Ireland,		284,128
Born in British colonies,		1,076
Born in foreign parts,		38,628
Not specified where born,		107,261

WALES.

Population in 1841—Males,	447,707	
Females,	463,896	
		911,603
Born in the counties where they live,		774,393
Born in other counties of Wales or England,		126,328
Born in Scotland,		1,173
Born in Ireland,		5,276
Born in British colonies,		12
Born in foreign parts,		616
Not specified,		3,805

SCOTLAND.

Population in 1841—Males,	1,241,862	
Females,	1,378,322	
		2,620,184
Born in the counties where they live,		1,988,024
Born in other Scotch counties,		451,234
Born in England,		37,796
Born in Ireland,		126,321
Born in British colonies,		272
Born in foreign parts,		2,776
Not specified,		13,750

Neglecting Wales, as of the least importance, we shall now compare the *migratory propensity* in the two kingdoms, by giving the results proportionally.

	Proportion per 1000. England.	Scotland.
Born in the county where they live,	807	759
Born in other counties of the same kingdom,	159	172
Born on the opposite side of the Tweed,	6	15
Born in Ireland,	19	48
Born in British colonies,	0	0
Born in foreign parts,	2	1
Not specified,	7	5
	1000	1000

We here find that our own country maintains its old character for emigration. In England alone dwell a number of persons of Scottish birth, equal to a full *twenty-sixth* of the population of Scotland, being 102,065. That is, one of every twenty-six persons born in Scotland goes to reside in England. In emigratory tendency, however, Scotland is immensely outstripped by Ireland. To it belong no fewer than 415,725 of the people dwelling in this island, being about one-nineteenth of the numbers of the home-dwelling people of Ireland. This overflow of the Irish population is unequally distributed in Great Britain. In England they form about 2 per cent. of the existing population. In Scotland they are 5 per cent., where it also appears there is an inequality in the counties, for, while Mid-Lothian contains 7000 Irish, Lanarkshire and Renfrewshire, which are nearer to Ireland, contain 76,300. The proportion to the native population is greatest in Wigton—14.7 per cent.

The proportion of the people of England who cross the Tweed to those who remain, is only about *one four-hundredth*—a very different result from any of the above. Here it may be borne in mind, that persons born in England are much less likely to emigrate to the north than in other directions. We do not know how many English are upon the continent and in America, regions to which they are much more apt to be attracted. It appears, however, that there is a greater degree of localisation of the people in England than in Scotland. Of every 1000 of the population, there are 807 living in the counties in which they were born, or 966 who are natives of these or other counties of their own country; while Scotland shows only 931 natives of every 1000 of the resident population.

Taking the subject in another point of view—the English residing in Scotland are in more striking quantity in proportion to the Scottish population, than are the Scotch residing in England. For our small population of 2,620,184 to contain 37,796 persons of English birth, is very remarkable. It could not have been believed upon any but statistical evidence, that 15 per thousand of the inhabitants of Scotland are English, while only 6 per 1000 of the population of England are from Scotland; a difference as 5 is to 2. There is actually a *sixteenth* of the whole population of Scotland of English or Irish birth. This shows that Scotland, while sending off adventurers to every other part of the world, receives also a number of adventurers from the two other kingdoms. Of the English in Scotland, nearly one fourth are in Edinburghshire, and somewhat less than another fourth are in Lanarkshire.

We trust that none of these results can be the subject of invidious or jealous feeling in any quarter. The Irish are acknowledged to be a useful though occasionally unruly set of people amongst us. The Scotch in England are, we believe, generally appreciated for their steady conduct in affairs which require thought and powers of management. We only speak a general sentiment when we remark, that the English settlers in our northern region are generally held in esteem. They are for the most part tradesmen engaged in lines of business hitherto little known in Scotland: a considerable class are teachers; there is also a large number of working men of superior skill. Any one who casts his eye along one of the principal streets of the New Town of Edinburgh, will remark the surprising number of shops occupied by persons with English names. As far as we are aware, these intrusions amongst us are regarded with anything but a hostile feeling. It was not so always. We have actually seen a document which was drawn up and signed by a large proportion of the tradesmen of Edinburgh about a century ago, binding themselves in mutual compact to cease entirely to give orders for goods to "English riders," as travelling commercial men were called in those days. The sore inflicted by the union was then fresh; but such feelings have long passed away as something only worthy of a rude age. The immigration of English into Scotland has advanced at an unusually rapid rate during the last twenty years; and the native people, especially in the capital, are consequently becoming more and more rapidly Anglicised. The speech, the manners, the style of thought, peculiar to England, are becoming every year more conspicuous amongst us. And, if experience is here to hold good, we may judge it to be very likely that another century will see most of the Scottish peculiarities left to a few of the rural and more remote provinces; for it has ever been found that when two populations are thrown together, the larger tends to absorb the less into itself.* But is this to be lamented? Assuredly not, if, as we believe, an amalgamation never takes place without producing an improvement. It may be expected that some of the less amiable features of our countrymen—as, for instance, their dogmatic pertinacity and occasional illiberality—will be well exchanged for some of the frankness of the English character; refinement of manners advancing at the same time. At all events, such changes are irresistible; and to lament them, excepting for a moment in what may be called a poetical light, would be by no means significant of wisdom.

* At the beginning of the present century, there were in Edinburgh only three chapels in which the service of the church of England was performed, and these were situated in obscure parts of the town. There are now *eight* of these chapels, some of them the finest and largest public buildings in the city. Nothing more strikingly marks the Anglicising of Scotland, whether as respects the settlement of English people, or the adoption of English usages, than the progress of episcopal chapels throughout the country, scarcely a town now being without one.

THE TRAVELLING POWER OF ANIMALS.

SOME animals, it is well known, have a remarkable power of finding their way from one place to another far distant, and even to hit upon some particular spot which they had formerly known, or to which they have an attachment, or which they consider as their home. It is a power which we cannot but wonder at, seeing that man, in his civilised state, has not the least trace of it in his mental constitution.

Amongst the insect tribes, the bee is remarkable for the certainty with which it will return, after a long day's excursion, to the particular hive to which it belongs. This it does not only in cultivated countries, but even in the forest wilds of America, where no sort of special object can serve to guide its path. But, indeed, no such aid could be of service to the bee in its journeys, for its powers of vision are extremely defective. The same little creature which will make its way to the hive over extensive countries, will, when it arrives there, stumble and experience a difficulty in entering, if the aperture for admission have been in the least changed. This seems itself sufficient evidence that the journeying power of animals does not depend in any degree on the eyesight.

All round the globe, there is a seasonal migration of a considerable number of the feathered tribes, between the equatorial and temperate, and the temperate and arctic regions, in obedience, apparently, to the necessities of these animals with regard to food and temperature. The case with which we are most familiar in this country, is that of certain families of the field-birds, which dwell with us during the breeding season in spring, but flit to milder climes in order to spend the remainder of the year. The swallow, martin, nightingale, cuckoo, redstart, blackcap, are amongst those which have this habit. The phenomenon was doubted till very lately. The popular notion was, that these birds spent the winter in a dormant state in caverns and holes of the earth, for which there was perhaps some countenance in the occasional finding of a solitary bird so entranced. We find Dr Johnson unhesitatingly affirming to Boswell that the swallows sleep in winter: it was the belief of Pennant and Gilbert White. Now it is fully ascertained that these birds spend the greater part of their lives in mild climates, as Greece and the north of Africa. About February or March, they wing their way to the temperate regions, between the fortieth and sixtieth parallels, for the purpose of breeding. Why, it may be asked, should migratory birds not breed in the countries where they themselves spend the greater number of their days? The most plausible reason has been suggested by Mr Knapp in his beautiful book, "The Journal of a Naturalist:" the necessity of a peculiarly varied food for the young, such as only temperate climates can supply. The impulse to the migration is given by the organic changes in the animals, which lead to their breeding, and which are also the immediate causes of the vernal singing of birds. The male birds go first northward, probably from their first experiencing this peculiar impulse. On their arriving at the place of their destination, they express by their notes a fond impatience for the arrival of the other sex, which soon after takes place. Should the winter be unusually protracted, the birds return to a warmer latitude, and do not reappear till good weather has set in.

There are so many instances on record of particular birds returning to the exact spot where they built their nest formerly, that the fact cannot be doubted. Families residing in country houses are familiar with examples of certain recognisable swallows coming year after year, for so many as ten or twelve, to rebuild their nests in the angle of a particular window. As an example of this class of bird anecdotes—"Many years ago, a garret window in my house was accidentally left open, and a pair of rustic swallows built their fretted nest among the rafters, at which I was much pleased: and when they had hatched and reared their young, both they and their parents finding they were favourites, continued to play about the room all summer; and always roosted in it at night. Before they departed, a thought struck me to play them an innocent trick. One night I shut the window sash, and took them all in an angler's landing-net, and fastened round their necks, without hurting them in the least, rings made of the very fine wire that laps the lower strings of a violoncello. At this they took no offence, but played about till their departure. At their appointed period they vanished with their friends. The following spring the window was carefully set open for their admission, and they came accordingly, 'after the daffodils had taken the winds of March with beauty;' and to my great delight four had rings. One pair re-occupied the old nest, and another pair, or more, built in the room."* There is an authentic case of a redstart returning for sixteen years to build in the same garden.† Birds have even been known to return

* Loudon's Magazine of Natural History, vi. 5.
† Ibid., new series, i. 133.

in spring to places where, in the preceding year, they had been confined, and quietly submit to a new captivity.

Birds, in their periodical migrations, generally fly in large flocks. They are seen to assemble on the last day of their residence with us, and then fly away together, leaving not one straggler behind. If a storm meets them at sea before they have gone far, they return to land, and wait for calmer weather. As might be expected, they are sometimes fain to light on vessels at sea, in order to rest their wearied pinions. Of some birds, the flocks which travel at once are prodigious: the passenger-pigeon of America is the most remarkable in this respect. Mr Audubon describes some of the *columns* which he has observed flying with hardly an interruption for hours at a time, and calculates that in one only, during three hours, there must have passed eleven hundred millions of birds!

It would be improper to enter here at large upon the extraordinary powers of the carrier-pigeon, as these have been already detailed in the Journal. But we may allude to the fact of this bird having returned from Paris to Constantinople, nearly the whole breadth of Europe. Philosophy is bewildered in contemplating feats of this kind, which are by no means uncommon in other animals, although birds are obviously best suited for finding their way across a great extent of intermediate country. Cats have the travelling power in a very remarkable degree, and there are numberless instances of their having been carried to distant places in sacks or closed baskets, and yet returning to their former abode. One of the most interesting of these anecdotes is related by Mr Jesse in his delightful volume, "Gleanings of Natural History." "A lady residing in Glasgow had a handsome cat sent to her from Edinburgh [distance forty-two miles]; it was conveyed to her in a close basket and a carriage. The animal was carefully watched for two months; but, having produced a pair of young ones at the end of that time, she was left to her own discretion, which she very soon employed in disappearing with both her kittens. The lady at Glasgow wrote to her friend in Edinburgh, deploring her loss; and the cat was supposed to have formed some new attachment. About a fortnight, however, after her disappearance from Glasgow, her well-known *mew* was heard at the door of her Edinburgh mistress, and there she was with both her kittens; they in the best state, but she herself very thin. It is clear that she could carry only one kitten at a time; so that, if she brought one kitten part of the way, and then went back for the other, and thus conveyed them alternately, she must have travelled one hundred and twenty miles at least. She must have also journied only during the night, and must have resorted to many other precautions for the safety of her young."

In thus returning to the favourite spot, animals will sometimes perform difficult feats, to all appearance beyond their strength. A horse brought out of the Isle of Wight has been known to return thither, although the narrowest sea between the island and mainland is five miles across. A gentleman bathing near Dunraven castle, in Glamorganshire, observed a strange object approaching at some distance. It proved to be a horse, which had apparently swam from the opposite coast, twelve miles distant. There is a story of a cow having returned from England to its native place in Scotland in the reign of James I. The king's remark was at once a joke and the statement of a real difficulty—"he only wondered how it had contrived to get across the border" (that district being then full of cattle-stealers). Welsh sheep often find their way home to their native mountains from the neighbourhood of London. About fourteen years ago, a butcher in Dundee had a dog which became notorious for every now and then disappearing for a few days. It was ascertained that it was in the custom, on those occasions, of going to Edinburgh to see a friend of its own species belonging to a butcher in the market. Now, Dundee is not only forty-two miles from Edinburgh, but two estuaries, requiring to be crossed by ferry-steamers, intervene. "A gentleman residing at Caversham, bought two pigs at Reading market, which were conveyed to his house in a sack, and turned into his yard, which lies on the banks of the river Thames. The next morning the pigs were missing; a hue and cry was immediately raised, and towards the afternoon a person gave information that two pigs had been seen swimming across the river at nearly its broadest part. They were afterwards seen trotting along the Pangborne road; and in one place where the road branches off, putting their noses together, as if in deep consultation. The result was their safe return to the place from which they had been conveyed to the Reading market, a distance of nine miles, and by cross roads. The farmer from whom they had been purchased brought them back to their owner, but they took the very first opportunity to escape again, recrossed the water—thus removing the stigma upon their race, that they are unable to swim without cutting their own throats—and never stopped until they found themselves at their first home."*

The migrations of the land-crab of tropical countries is annual, and is for the purpose of spawning. In the Bahama Islands, this animal leads an obscure life, feeding upon vegetables in the recesses of the mountains. About April or May, millions of them proceed towards the sea, usually in three battalia, the first being composed of males, the second of females, and the third of weakly members of the community of both sexes. Under the guidance of a leader, they take the route for the sea with surprising directness, neither turning to the right nor the left; crossing over houses, if they come in the way, and only turning aside when they meet with a river. Sometimes the journey requires three months to be performed, and when they have spawned and cast their shells, they return once more to their caves and clefts, taking probably six weeks to the journey."

The two most surprising anecdotes which we have ever heard regarding the travelling power of animals, we shall give in the words of the original narrators. The first was received by Mr Jesse from an officer of rank in the army. "He informed me," says Mr Jesse, "that a ship which touched at the island of Ascension on her way to England, took in several large turtle, and amongst others one which, from some accident, had only three fins. It was in consequence called, and known on board the ship, by the name of Lord Nelson. It was marked, in the usual way, by having certain initials and numbers burnt upon its under shell with a hot iron, which marks are known never to be obliterated. Owing to various causes, the ship was a long time on her passage homewards—a circumstance which caused a great many of the turtle to die, and most of the rest were very sickly. This was the case with the Lord Nelson; which was so nearly dead when the vessel arrived in the Channel, that the sailors, with whom it was a favourite, threw it overboard, in order, as they said, to give it a chance. Its native element revived it, for, two years afterwards, the same turtle was again taken at its old haunt on the island of Ascension!"

The second anecdote appears in the elaborate work of Messrs Kirby and Spence. "In March 1816 an ass was shipped at Gibraltar on board the Ister frigate, Captain Forrest, which was bound for Malta. The vessel being struck on the sands off the Point de Gat, at some distance from the shore, the ass was thrown overboard to give it a chance of swimming to land—a poor one, for the sea was running so high, that a boat which left the ship was lost. A few days afterwards, however, when the gates of Gibraltar were opened in the morning, the ass presented himself for admission, and proceeded to the stable which he had formerly occupied, to the no small surprise of its former owner, who imagined that, from some accident, the animal had never been shipped on board the Ister. On the return of this vessel to repair, however, the mystery was explained, and it turned out that Valiante (so the ass was called) had not only swam safely to shore, but without guide, compass, or travelling map, had found his way from Point de Gat to Gibraltar, a distance of more than two hundred miles, which he had never traversed before, through a mountainous and intricate country, intersected by streams, and in so short a period, that he could not have made one false turn. His not having been stopped on the road was attributed to the circumstance of his having formerly been used to whip criminals upon, which was indicated to the peasants, who have a superstitious horror of such asses, by the holes in his ears, to which the persons flogged were tied."

There are instances of hounds having returned from England to Ireland, and of cats traversing nearly the whole island in order to regain a favourite place of abode. There are also instances of dogs having returned to France across the Channel. The circumstances attending one such case are curious and amusing. "An officer in the 44th regiment, who had occasion, when in Paris, to pass one of the bridges across the Seine, had his boots, which had been previously well polished, dirtied by a poodle dog rubbing against them. He in consequence went to a man who was stationed on the bridge, and had them cleaned. The same circumstance having occurred more than once, his curiosity was excited, and he watched the dog. He saw him roll himself in the mud of the river, and then watch for a person with well polished boots, against which he contrived to rub himself. Finding that the shoeblack was the owner of the dog, he taxed him with the artifice; and, after a little hesitation, he confessed that he had taught the dog the trick, in order to procure customers to himself. The officer, being much struck with the dog's sagacity, purchased him at a high price, and brought him to England. He kept him tied in London some time, and then released him. The dog remained with him a day or two, and then made his escape. A fortnight after, he was found with his former master pursuing his old trade on the bridge."†

It fully appears, as we conceive, from all the facts which have been stated, that this travelling power of animals has no necessary connection with eyesight, smell, or any kind of perception whatever, but is a peculiar instinct operating in a way of which we can form no clear idea. This view is supported, to our apprehension, by a particular consideration affecting instinct. This class of mental powers is largely developed in the animals, compared with man; but, as the animals have a rudimental form of our ordinary intellectual powers, so do men seem to have a rudimental development of some of the instincts so largely bestowed upon them. These are only traceable with any clearness in the savage state. The wild Indian, it is well known, has all the natural perceptive powers in far higher activity and refinement than the civilised man. He has also some faint share of that wonderful power which enables birds, reptiles, and mammals of various species, to find their way over large unknown tracts to particular places formerly known. It has been stated of the Australian savages, on first-rate authority, that they are enabled to return for hundreds of miles to their homes, though totally unacquainted with the route, being led by an intuitive impulse which they cannot explain. There are some instances of Europeans finding their way home at night by paths unknown to them, when in a state of intoxication so great, as to have left them no recollection of the circumstances; and we often hear of blind men getting through difficulties with a degree of accuracy very difficult to comprehend. Whether these last instances are of the same class with the former, may be doubted: perhaps they are more allied to the phenomena of somnambulism, speaking of a new state of mind, the existence and characters of which we are perhaps only now on the borders of ascertaining. But of the instances presented by savages, there seems to be little doubt that they belong to that class of phenomena, of which we have here so many examples. If so, they are certainly favourable to the notion, that *epizooty*, as it is called, or the travelling power of animals, depends on one of those instincts which are totally distinct from reason, and which reason would vainly attempt to explain. Considered in this light—a mental power unlike all others, even of the instinctive kind—a something more subtle than the attraction of the needle to the pole, seeing that that can be connected with electricity, which in some forms is visible—it surely presents a strong argument for our not too hastily scoffing at things which only appear illusory, seeing that there may be many as mysterious as this, but which do not happen to be readily provable by resulting facts.

* Jesse's Gleanings, p. 293.

* Wonders of Nature.

† Jesse's Gleanings, p. 118.

A REMEDY IN PUTRID FEVER.

Some people see the most remarkable circumstances pass under their notice without having an idea excited in their minds: others allow nothing to go unobserved, and are inclined to search out the cause of every phenomenon that comes before them. Among the latter class—the intelligent minority of mankind—appears to have been the late Dr Edmund Cartwright, inventor of the power-loom. This gentleman, while performing the duties of a parish clergyman, an office which he gracefully blended with that of friend and physician to his flock, made the discovery, that yeast is efficacious in the cure of putrid fever. In his memoirs, lately published, he gives the following account of the manner in which he ascertained this remarkable fact:—

"During my residence, upwards of twenty years, at Brampton, a populous parish near Chesterfield, a putrid fever broke out amongst us. Finding by far the greater number of my parishioners too poor to afford themselves medical assistance, I undertook, by the help of such books on the subject of medicine as were in my possession, to prescribe for them. I attended a boy about fourteen years of age who was attacked by the fever. He had not been ill many days before the symptoms were unequivocally putrid. I then administered bark, wine, and such other medicines as my books directed. My exertions were, however, of no avail; his disorder grew every day more and more untractable and malignant, so that I was in hourly expectation of his dissolution. Being under the necessity of taking a journey, before I set off I went to see him, as I thought, for the last time; and I prepared his parents for the event of his death, which I considered as inevitable, and reconciled them in the best manner I could to a loss which I knew they would feel severely. While I was in conversation on this distressing subject with his mother, I observed in a corner of the room a small tub of wort working. The sight brought to my recollection an experiment I had somewhere met with of a piece of putrid meat being made sweet by being suspended over a tub of wort in the act of fermentation. The idea flashed into my mind that the yeast might correct the putrid nature of the disease, and I instantly gave him two large spoonsful. I then told the mother, if she found her son better, to repeat this dose every two hours. I then set out on my journey. Upon my return after a few days, I anxiously inquired after the boy, and was informed that he was recovered. I could not repress my curiosity, and though greatly fatigued with my journey, and night was come on, I went directly to his residence, which was three miles off, in a wild part of the moors, and, to my great surprise, the boy himself opened the door, looking well, and he told me he had felt better from the time he took the yeast.

After I left Brampton, I lived in Leicestershire. My parishioners there being few and opulent, I dropped the medical character entirely, and would not prescribe even for my own family. One of my domestics falling ill, the apothecary was sent for. Having great reliance on the apothecary's skill and judgment, the man was left entirely to his management. His disorder, however, kept gaining ground, and the apothecary finding himself baffled in every attempt to be of service to him, told me he considered it to be a lost case, and in his opinion the man could not live twenty-four hours. On this I determined to try the effects of yeast. I gave him two large spoonsful, and in fifteen minutes from taking the yeast, his pulse, though still feeble, began to get composed and full. In

thirty-two minutes from his taking it he was able to get up from his bed. The expression that he made use of to describe the effect on his own feelings was, that he felt 'quite lightsome.' At the expiration of the second hour I gave him sago, with wine and ginger, &c., and in another hour repeated the yeast. An hour afterwards I gave the bark as before; at the next hour he had food, and an hour after that another dose of yeast. He continued to recover, and was soon able to go about his work as usual.

About a year after this, as I was riding past a detached farm-house, at the outskirts of the village, I observed the farmer's daughter standing at the door, apparently in great affliction. On inquiring into the cause of her distress, she told me her father was dying. I went into the house, and found him in the last stage of putrid fever. His tongue was black, his pulse was scarcely perceptible, and he lay stretched out like a corpse, in a state of drowsy insensibility. I immediately procured some yeast, which I diluted with water, and poured it down his throat. I then left him with little hope of recovery. I returned to him in about two hours, and found him sensible and able to converse. I then gave him a dose of bark. He afterwards took at proper intervals some refreshment. I stayed with him till he repeated the yeast, and then left him with directions how to proceed. I called upon him the next morning at nine o'clock, and found him apparently recovered; he was an old man, upwards of seventy."

A FRENCHMAN IN THE UNITED STATES.

LAST week we took occasion to make a short extract from a work which had recently fallen under our notice, the travels of M. Chevalier in the United States,* and we now recur to it for the purpose of bringing it more pointedly under the attention of our readers. M. Chevalier seems to differ very materially from his countrymen generally, for he has the rare merit of considering that there are other nations in the world besides his own which are equally intelligent, perhaps more powerful, certainly as worthy of philosophic consideration. The work he has produced appears to be remarkably free of unfortunate home prejudices; the author's vision is, upon the whole, less shaded than is usual amongst travellers with that deceptive mist—the bigotry of national feeling.

The preface informs us that M. Chevalier was sent to the United States in 1834 under the patronage of Thiers, then minister of the interior in France. His mission was chiefly to inspect the public works of the States, but extending his time and researches, he took opportunities of studying the workings not only of the mechanical, but of the social and political machinery, by means of which our transatlantic friends are enabled to "go ahead." In spite, however, of the promises of the preface, we find, on reading the letters, that they are singularly deficient in detail: instead of describing what he saw, M. Chevalier gives the impressions his observations created on his own mind, together with his speculations thereon. His impressions would appear, on comparison with those of former travellers, to be correct enough: some of his speculations are just, though others may be regarded as fanciful. Occasionally, we are afforded a glimpse of what extraordinary things are accomplished in a short time in America—towns springing up with the alacrity of mushrooms, but possessing all the enduring stamina of the oak. Lowell, in Massachusetts, to which we have frequently alluded in these pages, is one of these remarkable seats of population and wealth. "Twelve years ago," says M. Chevalier, writing in 1834, "the site of Lowell was a barren waste, in which the silence was interrupted only by the murmur of the little river of Concord, and the noisy dashings of the clear waters of the Merrimac against the granite blocks that suddenly obstruct their course. At present it is a pile of huge factories, each five, six, or seven storeys high, and capped with a little white belfry, which strongly contrasts with the red masonry of the building, and is distinctly projected on the dark hills in the horizon. By the side of these larger structures rise numerous little wooden houses, painted white, with green blinds, very neat, very snug, very nicely carpeted, and with a few small trees around them, or brick houses in the English style, that is to say, simple, but tasteful without and comfortable within; on one side fancy-goods' shops and milliners' rooms without number, for the women are the majority in Lowell, and vast hotels in the American style, very much like barracks (the only barracks in Lowell); on another, canals, water-wheels, waterfalls, bridges, banks, schools, and libraries, for in Lowell reading is the only recreation, and there are no less than seven journals printed here. All around are churches and meeting-houses of every sect—Episcopalian, Baptist, Congregationalist, Methodist, Universalist, Unitarian, &c., and there is also a Roman Catholic chapel. Here are all the edifices of a flourishing town in the Old World, except the prisons, hospitals, and theatres; everywhere is heard the noise of hammers, of spindles, of bells calling the hands to their work or dismissing them from their tasks, of coaches-and-six arriving or starting off, of the blowing of rocks to make a mill-race or to level a road; it is the peaceful hum of an industrious population, whose movements are regulated like clockwork; a population not native to the town, and one half of which at least will die elsewhere, after having aided in founding three or four other towns; for the full-blooded American has this in common with the Tartar, that he is *encamped*, not established, on the soil he treads upon." The operatives—as our readers have already been made aware from our extracts of Boz's work—are chiefly young females, who board in houses provided for the purpose by the proprietors, and which are kept under very strict regulations.

At Pittsburg, the author obliges us with some information concerning the town. Seventy-six years ago, it was a small fort called Duquesne, which the French were obliged to evacuate, and of whose sway not a vestige remains. The town is now "essentially pacific; if cannon and balls are seen here, it is because a trading people make it a rule to supply the market with whatever is wanted. The cannon are new, fresh from the mould, and equally at the disposition of the sultan Mahmoud, or the Emperor of Morocco, or the government of the States, whichever will pay for them. Pittsburg is a manufacturing town, which will one day become the Birmingham of America; one of its suburbs has already received that name. It is surrounded, like Birmingham and Manchester, with a dense black smoke, which, bursting forth in volumes from the founderies, forges, glass-houses, and the chimneys of all the manufactories and houses, falls in flakes of soot upon the dwellings and persons of the inhabitants; it is, therefore, the dirtiest town in the United States. Pittsburg is far from being as populous as Birmingham, but it exhibits proportionally a greater activity. Nowhere in the world is everybody so regularly and continually busy as in Pittsburg; it is, therefore, one of the least amusing cities in the world; there is no interruption of business for six days in the week, except during the three meals, the longest of which occupies hardly ten minutes, and Sunday in the United States, instead of being, as with us, a day of recreation and gaiety, is, according to the English custom—carried to a greater degree of rigour by the Anglo-Americans—consecrated to prayer, meditation, and retirement. By means of this energetic assiduity in work, which is common to all ages and classes, and by the aid of numerous steam-engines, which labour like humble slaves, the inhabitants of Pittsburg create an amount of products altogether disproportioned to their number." The author visited an anthracite coal district in the neighbourhood of Pittsburg. "In this anthracite region," he continues, "in the manufacturing districts of the north east, along the New York canals, and in all parts of the west, a traveller often has an opportunity of seeing the process of building towns. First rises a huge hotel with a wooden colonnade, a real barrack, in which all the movements—rising, breakfasting, dining, and supping—are regulated by the sound of a bell with military precision, uniformity, and rapidity, the landlord being, as a matter of course, a general, or, at least, a colonel of the militia. The bar-room is at once the exchange, where hundreds of bargains are made under the influence of a glass of whisky or gin, and the club-room, which resounds with political debate, and is the theatre of preparations for civil and military elections. At about the same time a post-office is established, at first the landlord commonly exercising the functions of postmaster. As soon as there are any dwelling-houses built, a church or meeting-house is erected at the charge of the rising community; then follow a school-house and a printing-press with a newspaper, and soon after appears a bank, to complete the threefold representation of religion, learning, and industry. A European of continental Europe, in whose mind the existence of a bank is intimately associated with that of a great capital, is very much surprised even for the hundredth time at finding one of these institutions in spots yet in an intermediate state between a village and the primitive forest inhabited by bears and rattle-snakes. On the banks of the Schuylkill, which has lately been canaled, and which, flowing from the coal region, empties itself into the Delaware near Philadelphia, may be seen the beginnings of a town, built during the time of the mining speculations, at the head of navigation. Port Carbon, for that is its name, consists of about thirty houses standing on the declivity of a valley, and disposed according to the plan of the embryo city. Such was the haste in which the houses were built, that there was no time to remove the stumps of the trees that covered the spot; the standing trees were partially burnt, and then felled with the axe, and their long charred trunks still cumber the ground. Some of them have been converted into piles for supporting the railroads that bring down the coal to the boats; the blackened stumps, four or five feet high, are still standing, and you make your way from one house to another by leaping over the prostrate trunks, and winding round the standing stumps. In the midst of this strange scene appears a large building with the words, OFFICE OF DEPOSIT AND DISCOUNT. SCHUYLKILL BANK."

The chief object of M. Chevalier's mission—inspection of the public works of the United States—is afterwards gone into. Of railroads:—"On most of the American railroads, the inclinations are much greater than what in Europe are usually considered the *maxima*. A rise of 35 feet to the mile, for instance, seems moderate to American engineers, and even 50 feet does not frighten them. Experience has shown that these inclinations, the latter of which is double of the *maximum* established by our engineers, do not endanger the safety of travellers. They do, indeed, diminish the rate of speed, unless additional power is applied at certain points to increase the force of traction; but the Americans think that these inconveniences are more than overborne by the reduction of the first cost of construction. The curves are also greater. On the Baltimore and Ohio railroad, on which locomotives are used, there are several with a radius of 400 or 500 feet; but the consequence is, that on this road the mean rate of speed does not exceed 12 or 13 miles an hour, only half as great as that on the Liverpool railroad, but twice as great as that of a coach on an ordinary road. In general, however, the American engineers endeavour to avoid curves of less than 1000 feet radius. In France, the board of public works (*Ponts et chaussées*), in their surveys and plans, have fixed upon 2700 feet as the *minimum*. On some of the American railroads, however, even the rules of European science have been exceeded; on the Lowell railroad the *minimum* radius is 3000 feet; on the Boston and Providence railroad there is no curve of a less radius than 6000 feet. The rate of velocity on the American railroads is as various as the manner of their construction, and the amount of their inclinations and curvatures. On the Boston and Lowell road the rate is nearly 25 miles an hour; on the Boston and Providence and Worcester roads it is about 20 miles; on the Camden and Amboy railroad the mean velocity has been reduced to 15 miles; on the Charleston and Augusta road it is only about 12, and it is still less on the Baltimore and Ohio railway.

One of the chief means of economy in the construction of these works in this country is the use of wood for bridges. The Americans are unequalled in the art of constructing wooden bridges; those of Switzerland, about which so much has been said, are clumsy and heavy compared with theirs. The American bridges have arches of 100 and 200 feet span, and they are not less remarkable for their cheapness than for their boldness. The bridge over the Susquehanna, at Columbia, is 6000 feet long, and cost 130,000 dollars; it is roofed over, has two carriage-ways and two side-ways for foot passengers. In general, the wooden superstructure of a covered bridge, with a double carriage-way, may be built at the rate of 8000 to 14,000 dollars, according to the locality and the character of the work, per 600 feet; a similar structure with us would be built of hewn stone, and would cost at least 200,000 to 300,000 dollars. The masonry is generally of uncut stone, or of undressed hewn stone, and is not therefore expensive."

Regarding the social features of the states, our author's remarks are exceedingly general—too much so, indeed, to warrant great faith in their correctness, when we consider the short time he remained in the country, and his limited opportunities of observing the people individually or in masses. The most striking points of their social characteristics are, nevertheless, to all appearance, justly described. Chevalier wisely paints his portraits by comparison, and here follows one which is peculiarly happy:—"Approach an English merchant in his counting-room in the morning, and you will find him stiff and dry, answering you only by monosyllables; accost him at the hour of closing the mails, he will be at no pains to conceal his impatience; he will dismiss you, without always taking care to do it politely. The same man in his drawing-room in the evening, or at his country-house in summer, will be full of courtesy and attention towards you. The Englishman divides his time, and does but one thing at once; in the morning he is wholly absorbed in business; in the evening he plays the man of leisure, reposing and enjoying life; he is a gentleman, having before his eyes, in the English aristocracy, a perfect model to form his manners, and to teach him how to spend his fortune with dignity and grace. The modern Frenchman is a confused mixture of the Englishman of the evening and the Englishman of the morning; in the morning a little of the former, in the evening a little of the latter. The old French model was the former, or rather, to do each one justice, was the original after which the English aristocracy has formed itself. The American of the north and the north-west, whose character now gives the tone in the United States, is permanently a man of business; he is always the Englishman of the morning. You find many of the Englishmen of the evening on the plantations of the south, and some are beginning to be met with in the great cities of the north.

Tall, slender, and light of figure, the American seems built expressly for labour; he has no equal for despatch of business. Nobody also can conform so easily to new situations and circumstances; he is always ready to adopt new processes and implements, or to change his occupation. He is a mechanic by nature; among us there is not a schoolboy who has not made a *vaudeville*, a ballad, or a republican or monarchial constitution; in Massachusetts and Connecticut, there is not a labourer who has not invented a machine or a tool. There is not a man of much consideration who has not his scheme for a railroad, a project for a village or a town, or who has not in *petto* some grand speculation in the drowned lands of Red River, in the cotton lands of the Yazoo, or in the corn fields of Illinois. Eminently a pioneer, the American who is not more or less Europeanised, the pure Yankee, in a word, is not only a working man, but he is a migratory one. He has no root in the soil; he has no feeling of reverence and love for the natal spot and the paternal roof; he is always disposed to

* Society, Manners, and Politics in the United States; being a series of letters from North America, by Michael Chevalier. Translated from the third Paris edition. Boston: Weeks and Co.

emigrate, always ready to start in the first steamer that comes along, from the place where he had but just now landed. He is devoured with a passion for locomotion; he cannot stay in one place; he must go and come; he must stretch his limbs, and keep his muscles in play. When his feet are not in motion, his fingers must be in action; he must be whittling a piece of wood, cutting the back of his chair, or notching the edge of the table, or his jaws must be at work grinding tobacco. Whether it be that a continual competition has given him the habit, or that he has an exaggerated estimate of the value of time, or that the unsettled state of everything around him keeps his nervous system in a state of perpetual agitation, or that he has come thus from the hands of nature, he always has something to be done, he is always in a terrible hurry. He is fit for all sorts of work, except those which require slow and minute processes. The idea of these fills him with horror; it is his hell. 'We are born in haste,' says an American writer; 'we finish our education on the run; we marry on the wing; we make a fortune at a stroke, and lose it in the same manner, to make and lose it again ten times over in the twinkling of an eye. Our body is a locomotive, going at the rate of twenty-five miles an hour; our soul a high-pressure engine; our life is like a shooting star, and death overtakes us at last like a flash of lightning.'" But with all this economy of time and liberality of labour, the American is no miser; he loves not money for its own sake, but for the benefits it brings him. "Among the sayings attributed to M. de Talleyrand, the following is often quoted:—'I don't know an American that hasn't sold his horse or dog.' It is certain that the Americans are an exaggeration of the English, whom Napoleon used to call a nation of shopkeepers. The American is always bargaining; he always has one bargain afoot, another just finished, and several more in meditation. All that he has, all that he sees, is merchandise in his eyes. The poetical associations which invest particular spots or objects with a character of sanctity, have no place in his mind. The spire of his village church is no more than any other spire to him, and the finest in his view is the newest, the most freshly painted. To him a cataract is a motive power for his machinery, a *mill privilege;* an old building is a quarry of bricks and stones, which he works without the least remorse. The Yankee will sell his father's house, like old clothes or rags. In his character of pioneer, it is his destiny to attach himself to nothing, to no place, edifice, object, or person, except his wife, to whom he is indissolubly bound night and day, from the moment of marriage till death parts them."

M. Chevalier's is an instructive rather than an amusing book. It is not calculated for general readers; but any person wishing to compile a description of North America, would find it a useful book of reference; carefully checked by the returns to Congress upon all matters connected with intercommunication, and our friend's favourite subject "banks."

Weekly Chit-Chat.

The appellation "John Dory," given by the fishermen of Britain to the Zeus faber, Dory, or Dorée, has no connection with the name John any more than Anchovy has with that of Ann; though every one must be aware of the punning allusion to eating Dory with Anchovy sauce, as being the legitimate marriage of John Dory and Ann Chovy. The Greeks have left evidence of the estimation in which they held this fish, by having named it after Zeus, or Jupiter, the father of the gods. Our common name of John Dory is clearly nothing more than a corrupt pronunciation of the French term for the colour of the lighter parts of the fish, which is yellow with metallic reflections when it is alive, and therefore styled *jaune dorée*, or yellow gilt.—Other etymologists ascribe this name to a very different origin. The Italians consider the Dory to have been the fish from whose mouth St Peter took the tribute money, leaving on its side the incontestable proofs of his finger and thumb; hence they call it *Gianitoré*, which is one of the honourable appellations of St Peter, the keeper or *janitor* of the portals of heaven. "We have thus converted," say this class of etymologists, "the name Gianitoré into 'Johnny Dory,' with the same happy ingenuity that has twisted *girasole*, or turnsol, into *Jerusalem* artichoke."

Advantages of Travelling.—It is surprising how a little knocking about in steamboats, and railways, and diligences, and schnell-posts, and voitures, of all sorts, and hotels with every variety of perfumes, shakes a man out of his sluggish thoughts and opaque humours. It is the best of all constitutional remedies for mind and body, although it acts but slowly on the whipcord nerves of the English. It is good for the brains and the stomach. It invigorates the imagination; loosens the blood, and makes it leap through the veins; dispels the nebulous mass of the stay-at-home animal; and, liberating the spirit from its drowsy weight of prejudices, sends it rebounding back, lighter and brighter than ever, with the fresh morning beams throbbing in its pulses. There is nothing in this levelling world of ours which so effectually annihilates conventional respectability as travelling. It tumbles down with a single blow the whole wire and gauze puppet, reducing its empty length and breadth to mere finery and saw-dust. All our staid, solemn proprieties, that beset and check us at every hand's turn like inauguration mysteries, as if we were entering upon some esoteric novitiate every day of our lives—all our family pride and class instincts—our local importance and stately caution—paddocks and lawns—liveries, revenues, and ceremonials—all go for nothing in the swirl and roar of the living tide. A great landed gentleman cannot bring his ten-feet walls, his deer-park, or his parish church with its time-honoured slabs and monuments, in the palm of his hand to the continent; he cannot stick the vicar and the overseer, and the bench of justices, in his hatband; he cannot inscribe the terror of the treadmill on his travelling bag; he cannot impress everybody abroad as he can at home, with the awful majesty of his gate-house, and the lump of plush that slumbers in the padded arm-chair; he has passed out of the artificial medium by which he has hitherto been so egregiously magnified, and he is forced, for once in his life, to depend solely on himself, docked of his lictors, for whatever amount of respect, or even attention, he can attract. This is a wholesome and healthy ordeal, very good for the moral as well as the biliary ducts. It sets a new and unexpected value upon whatever little sense or self-reliance one may really possess, and makes a man understand his manhood better in a month than he could have done in twenty years through the mirage of a false position.—*Foreign Quarterly Review.*

A Night with Burns.—In Ainsworth's Magazine there is an account of "A Night with Burns," by Dr Shelton Mackenzie; which, although too much concocted after a fashion that is the vice of magazines, is characteristic and entertaining. One Andrew Horner, a resident in Carlisle, went to Glasgow to publish a volume of poems, much admired by himself. Oddly enough, on his way home, he strayed out of the direct road into Ayr, where he met with Burns at a public-house, and some boon companions set the poet errant and the poet resident (whose fame was then unmade) to try their strength in a match of verse-making. "An epigram was the subject chosen, because, as Andrew internally argued, 'it is the shortest of all poems.' In compliment to him, the company resolved that his own merits should supply the theme. He commenced—

'In seventeen hunder thretty nine'—

and he paused. He then said, 'Ye see, I was born in 1739 [the real date was some year earlier], so I mak' that the commencemen'.' He then took pen in hand, folded his paper with a conscious air of authorship, squared himself to the table, like one who considered it no trifle even to write a letter, and slowly put down, in good round hand, as if he had been making out a bill of parcels, the line—

'In seventeen hunder thretty nine;'

but beyond this, after repeated attempts, he was unable to advance. The second line was the Rubicon he could not pass. At last, when Andrew Horner reluctantly admitted that he was not quite in the vein, the pen, ink, and paper were handed to his antagonist. By him they were rejected, for he instantly gave the following *viva voce*—

'In seventeen hunder thretty-nine,
The deil gat stuff to mak' a swine,
And put it in a corner;
But shortly after, changed his plan,
Made it to something like a man,
And called it Andrew Horner!'

The subject of this stinging stanza had the good sense *not* to be offended with its satire, cheerfully paid the wager, set to for a night's revelry with his new friends, and thrust his poems between the bars of the grate, when 'the sma' hours' came on to four in the morning. As his poetic rival then kindly rolled up the hearth-rug in a quiet corner of the room, to serve as a pillow for the vanquished rhymester—then, literally, a *carpet* knight—the old man, better prophet than poet, exclaimed, 'Hoot, man, but ye'll be a great poet yet!'"—*Spectator.*

Horse-Chestnut.—It is mentioned by a correspondent of the Gardeners' Chronicle, that the fruit of the horse-chestnut is carefully collected in the neighbourhood of Geneva, and sold to the butchers and graziers, by whom it is highly prized as food for sheep that are fattening. The chestnuts are well-crushed, or cut up by a machine kept solely in Switzerland for the purpose, and about two pounds' weight given to each sheep morning and evening. Sheep eat the fruit greedily; but it must be regularly portioned out to them, as too much is apt to disagree with them, it being of a heating nature. It is said to give an excellent rich flavour to the meat; and Geneva mutton is noted for being as highly-flavoured as any in England or Wales.

A self-acting ventilator for hospitals, public schools, theatres, and other places of public resort, has been recently invented by a Mr Thomas Wroughton, which, from its evident simplicity and utility, is worthy of extensive introduction. The apparatus consists of a ventilator connected with a mercurial valve, which is acted upon by heat, and by means of a float acting upon a sort of slide, a spring opens the ventilator, so as to admit precisely such a quantity of external air as will purify the internal atmosphere, and bring it down to a determined point. We will suppose, for instance, that it is desired that the temperature should be a fixed one of sixty degrees of Fahrenheit. The thermometer connected with his mercurial valve is fixed at sixty. As soon as the heat of the place, from the breathing of the persons assembled, or from any other cause, has raised the temperature beyond this point, the valve opens of itself, and admits as much pure air as will cool down the temperature to the point desired, whilst the heated and foul air escapes.

Railway Transit.—From returns of 44 railways in Great Britain, extending over 1,562 miles, we learn that during the last week in October upwards of 500,000 passengers travelled upon them, paying fares amounting to L.76,002, 2s. 2½d., which, with the money received for the conveyance of goods, amounted to L.103,642, 2s. 2d. This is an average of about L.65 a mile per week. The traffic, therefore, produces fully at the rate of L.4,500,000 per annum, or one-sixth and a-half of the interest of the national debt. The yearly number of travellers by railway, calculated from the above weekly return, amounts to 20,000,000, or three millions more than the total population of Great Britain. Of course passengers do not count as individuals, for one person may travel several times in the course of the year.

Curious Relic.—A discovery of great historical importance, according to the Ceylon papers, was lately made by a gentleman at Manaar. In digging under the foundation of a very old house, some Roman bricks of a flat form were found, and, in sifting the rubbish, a gold ring, marked ANN. PLOC. (our types cannot imitate the exact characters), turned up, of ancient manufacture, quite plain, and of a shape similar to those in the British Museum, which are said to have been worn by Roman knights. Now, we know from Pliny that the farmer of the duties in the Red Sea, Annius Plocanius, was carried by a storm to the coast of Ceylon in the year 50 B.C.; he was of the equestrian order, and there seems little reason to doubt of the ring having belonged to him. It is much time-worn, or rather injured by the effects of damp and corrosion.

Things that do not look well.—We find the following in the Prairie Farmer, a backwoods newspaper:—

It does not look well to let the garden grow up to weeds, and then say that a garden is good for nothing.

It does not look well to have a gate without hinges, held up in the gateway by a prop in a "slantindicular" position, leaving at the bottom an aperture through which some hog with a convenient nose can rub, and so slip around into the garden.

It does not look well for a man to thump and abuse his horse or oxen, just to try his whip; or to suffer his boys to do so.

It does not look well to keep the horse in the stable not cleaned, till his hind-feet are 45 degrees higher than his fore-feet, so that he is obliged to rear up to get himself on a level every time he wishes to swallow a little hay or oats.

It does not look well to have the women hang out the clothes on rough and thorny bushes, and tear them in getting them off, when a neat line would save that trouble.

It does not look well for a man to keep six lank hungry greyhounds, when he can keep no cow or pig; and for no other purpose but to worry the neighbours' cattle and annoy the neighbourhood with continual barking.

It does not look well for farmers' daughters to be always talking about piano playing and the trillings of Signor Cantanini, while they do not know of what butter is made, and pretend to suppose a cow a rhinoceros.

It does not look well for anybody's daughters to walk the streets in kid slippers in December, and lace themselves so cruelly, that their voices waste away and their cheeks turn to the colour of moonlight.

BREAD.

BY MISS CAMILLA TOULMIN.

BREAD, BREAD! eat and be welcome friends;
Crumbs if ye will to the fowls of the air;
Or for your faithful dog leave broken ends;
Brutes, oh, believe me, are worthy man's care.
Eat and be nourished, or give and be blessed—
Aught in the wide world but waste or pollute it;
Touch it as something revered and caressed;
Scorn or indifference never can suit it!

Think how the harvest's God ripened the corn,
Call ye the growth of each young blade to mind—
Think how the summer sun rose every morn—
Think how the laden spears waved in the wind!
Think as they gleamed there, more burnished than gold,
Were they not war weapons serried for fight?
Marshalled to strive against hunger and cold,
Each with a star for dark misery's night!

Think ere ye fling it disdainfully down,
Of the sweat on the labourer's deep furrowed brow!
I tell you if ye have in idleness grown,
If nought of your *doing* on earth ye can show,
No matter your station, no matter your name,
To him bend the knee, with a bending heart too;
For homage, methinks, is the least he should claim,
Who does double duty for self and for you!

Double duty!—your pardon; oh! were it but so,
Did really one half of mankind do their part,
How quickly would close up the world's gulf of wo,
And joy heal the wounds of its care-stricken heart!
Then honour to all who with head or with hand,
Work wisely and well, and inherit the earth;
And scorn for the ignoble do-nothing band,
Who are but the locusts that prey upon worth!

Eat of it gratefully, eat and be filled;
Think of the gaunt ones who hunger for bread!
Be 'mong the thoughtless your lessons instilled;
Let bright example its influence shed!
Touch it as something revered and caressed,
Scorn or indifference never can suit it;
Eat and be nourished, or give and be blessed,
Aught in the wide world but waste or pollute it!

Printed and Published by W. and R. CHAMBERS, Edinburgh.
Sold by W. S. ORR, Amen Corner, London; J. MACLEOD, Glasgow; and all booksellers.
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